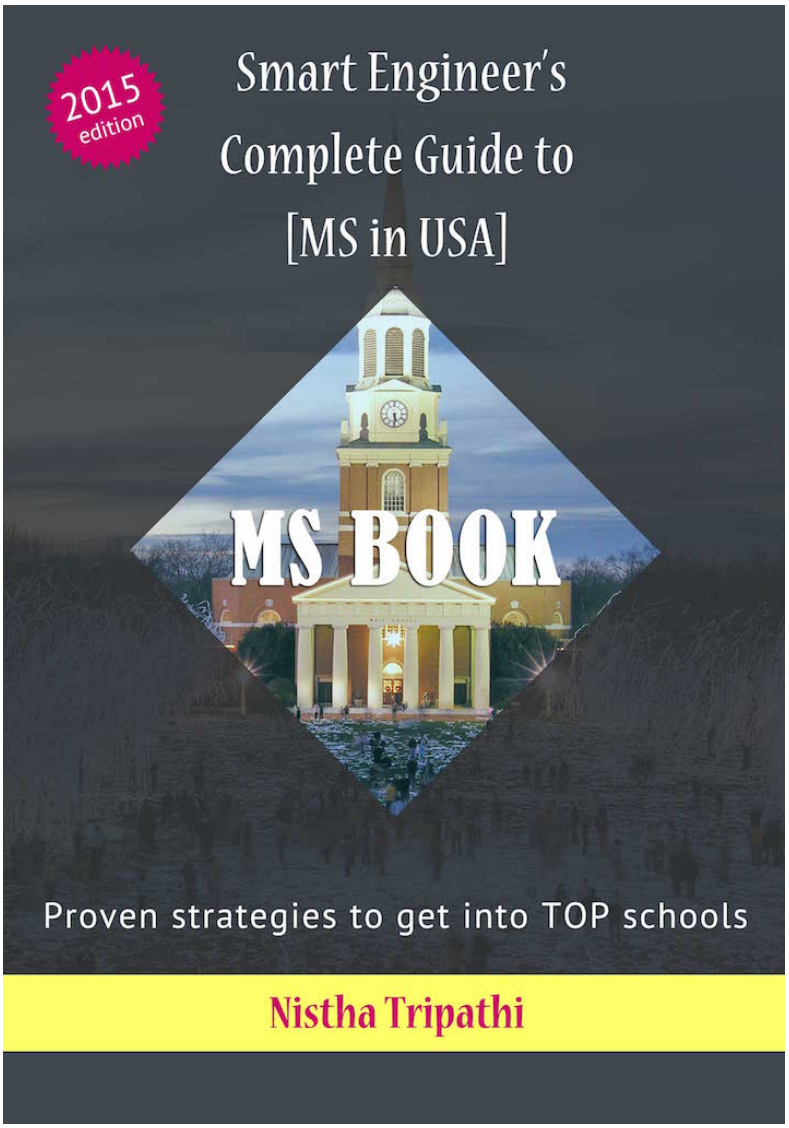


MS BOOK

{Sample Chapters}

Smart Engineer's Complete Guide to

[MS in USA]

Nistha Tripathi

SAMPLE CHAPTERS

You are previewing a part of the MS BOOK

Table of Contents

Introduction

Why did I write this book?

I am an engineer too. But it took me time to become a smart one. Here's a truth that we don't admit: we need less certificates and more of actual skills. We need better quality of jobs and heck, a better quality of life! But how do we get there?

So, you want to do MS?

It was not so much my passion for the field as it was the social pressure in India that precipitated my becoming an engineer. I had cleared both the Medical and Engineering entrance exams and eventually chose Engineering as a career because Medical study seemed exhausting and long. I do not tell that to my friends in USA because they will be aghast at knowing how I made the biggest decision of my life!

If you are reading this book, perhaps you are in the same boat I was a decade ago. I was clueless when I joined Computer Engineering at a central Indian college. It was years later that I understood what I wanted to do with my life. I don't want you to make the same mistakes and hence, spent a year on writing this book.

In between, I have studied MS in Computer Science from University of Illinois, Urbana Champaign (world's 5th best program in Computer Science) and worked as Assistant Vice President on Wall Street (Citigroup) before going for MBA at New York University (world's 10th best MBA program). I dropped out of MBA when I received a great job opportunity at a successful startup in Manhattan. In 2012, I quit my corporate jobs in New York to return to India to motivate students and build next generation education platforms. I founded Scholar Strategy at www.scholarstrategy.com, a student-mentoring venture that helps Indian engineers get into top graduate programs across the world. Sometimes, I even told students to wait and work for a year. The genuine guidance has outperformed the local counselors in major cities and that is when I realized that we were doing something right.

I have interacted with hundreds of students through my ventures and for this book. There is one conclusion at the end: we need a better way to plan our careers.

While you may not have landed into the engineering career path by a rational choice, it does have its advantages. It opens a lot of lucrative gates and if you strategize smartly, you can be both successful and happy. One such option is 'Pursuing MS/PhD from USA' and that is what I shall focus on in this book.

How to begin?

Right this moment, you need to decide one thing and that is this - STOP PASSING YOUR BLAMES and START TAKING RESPONSIBILITY.

If I begin to think who to blame for a slow start in my career, I can start counting society, parents, teachers, neighbors, relatives, that awful aunt who always compared her kids, the family friends who looked down upon students who are pursuing Arts etc. I can keep blaming all I want but nothing is going to change! So, I stopped doing that and started thinking what I can do to change my situation starting right now.

Same goes for you. If you want this book to make any difference in your life, you need to start being responsible for your choices. No more of 'what will I tell my parents' or 'what will my neighbor think'. You can either think what others are going to think about you or you can think what you should be thinking. This book cannot help those who are making their choices to please others.

Where do Indian engineers go wrong?

I can go on and on about this but to begin with, think about the following-

1. We chose a career not knowing what it entails.
2. We thought high marks are all that we need to succeed. Another irony that we do not know what success means for us. So, we spend whole college life trying to get good marks.
3. We even skip on assignments and never cared for the labs or practicals.
4. We join CAT coaching because that's what everyone is doing. We don't even know if we want to do banking or consulting or something else afterwards.
5. We give GATE and do M.E. or M.Tech. and are looking for same jobs that we were looking for after B.E. or B.Tech. So, after spending 2 years on so called post-graduation, we are back to square one.

6. We chose the job which paid the most and after few years, having not acquired any valuable skill, we become good for nothing. Ouch.

If you are nodding your head while reading this, you will find this book useful because one thing that we are going to do right away is ACT for our betterment! By understanding the pros and cons of studying abroad option, we will make an informed choice about our careers. Believe me, that is way better than what we have been doing so far.

But everyone else is doing this...

Everyone else is doing what he or she thinks everyone else is doing.

But we are not like everyone else, we are going to understand and choose things that work for us. So, when your uncle Mr. Sharma tells you that you should do an MBA, you should ask, "Why?"

He will probably tell you that most of the smart people he knows have done MBA. To which, you can politely reply, "But I have researched different career streams and to be XYZ, it is better for me to work right now. I will do MBA if I need it later on."

Most of the people will give you illogical replies to that and try to force their opinions on you but if you have done your groundwork, you will know what you have to do.

So, enough of 'this is what others are doing…' We are never ever going to use that logic again.

Chapter 1

All About MS

India trains 1.5 Million engineers every year[1] in more than 3300 engineering colleges[2]. With this ever-increasing supply of engineers, the employment opportunities are rapidly falling short. Unsurprisingly, many capable engineers look for ways to stand out of the crowd by pursuing lucrative graduate degrees from world's best schools. And, that's not easy. The Engineering Graduate School at University of California, Berkeley has an acceptance rate of 12.4%[3]

In this book, we zero in on the M.S. (Master of Science) programs in United States, which is the most popular academic destination due to its high quality research and curricular facilities and environment. The purpose of this book is to make engineers familiar with the relevant programs and help them get into the best program possible.

After reading this book, you should know the answers to the following:

- What is MS all about?
- Is MS the right path for YOU?
- How to successfully apply to top MS programs in USA?
- How to spend your time wisely in the Graduate School?
- What are the career prospects and options after MS?
- Learn from the Indian engineers who have carved different successful careers after pursuing MS

Graduate or Post Graduate?

First, let us clarify the terminology. What we call post-graduate degree in India is equivalent to the graduate degree in USA. These include MS, PhD, MBA, MA, M.Tech. and so on. Whereas our post-secondary education or Bachelor's degree is known as undergraduate education in USA which includes BS, BA, B.Tech. etc. It is

just a matter of nomenclature. So, whenever we refer to graduate programs in this book, we mean the graduate programs in USA - particularly MS unless specified.

Overview of MS

After finishing four years of engineering school, Indians can apply to MS and PhD programs in USA. Typically, MS is a research-oriented degree that may or may not require a thesis to be completed. The programs that are industry oriented might be termed as professional M.Eng. programs such as the ones offered by Cornell, Duke, Berkeley etc. Depending upon the credit requirement by different schools, one can finish MS program in 1.5 or 2 years (further details in Chapter 13). Usually, candidates apply to pursue MS in the field of their undergraduate major but one can pursue MS in a different area of study as well. MS lets you take advanced courses in your field and specialize in certain areas if you wish. It offers great opportunities to pursue research or advanced academic projects under highly reputed faculty. If you are more inclined towards research oriented jobs and academia, then PhD is an important-to-have qualification. PhD can take more than five years for completion depending upon your advisor.

A relatively new program, MS in MIS (Management Information Systems), is gaining popularity these days. It is a specialized Engineering Management program mostly offered by College of Business with an option to take electives in School of Engineering (or vice-versa). This program combines technical depth in Information Systems with business breadth so that the students can understand both management and engineering language, thus succeed in managing IT (Information Technology). Since this offers a great opportunity for engineers to get an exposure to business education without losing their domain expertise, increasing number of engineers are opting for MIS these days.

One can go for MS directly after Bachelor's degree or after gaining few years of work experience. While corporate work experience is valuable for MIS (and other Engineering Management programs), research related experience is more helpful for MS and PhD. Please note that work experience is not mandatory (see Chapter 4). When we want to talk about MS in MIS programs in this book, we will simply use the term MIS. Unless specified, MS will refer to traditional Master's in engineering majors such as MS in Computer Engineering, MS in Computer Science, MS in Electrical Engineering and so on.

Apart from the curricular expertise that you gain, the most important thing you get through a graduate degree from a premier institute in USA is a seal of approval. Having been admitted to a top graduate school itself is recognition of your intellect and talent and puts you at an advantage against the candidates without these degrees.

What about the bad economy?

You may have heard about the floundering economy and difficulty of getting jobs in USA. This makes you wonder whether it is wise to pursue higher education under these circumstances. Before packing your bags for a foreign land, you should definitely ask all questions that have a direct bearing upon your career prospects. Today in 2015, the American economy has recovered from the dire levels of 2008. The challenges may change next year but the important point is to ask whether an MS education and credential will help you in the long run or not? There have been people who could not find a job after graduating in 2008 and there are people who still got extraordinary job offers in the same year.

As per the results of the 2012 Engineering Income and Salary Survey, conducted by the American Society of Mechanical Engineers (ASME) and the American Society of Civil Engineers (ASCE),[4] the employment outlook has been improving with more and higher salary offers being made to engineering students. Technical majors, especially those in engineering head the list of top-paid majors for the Class of 2013.[5]

While the micro and macro economic forces will always affect the job market, your ability to navigate through the tough tides will determine how far can you go today and in future. So, the real question to ask is whether you intend to do MS for the right reasons or not? (see Chapter 4)

How about the expensive dollar?

We have all seen the fall of Rupee against Dollar in past 2 years. This has suddenly made it much more expensive to attend foreign education. Let's see its indirect impacts:

- **Financial Aid becomes more critical** – Same school fee is now 10-15% more expensive for you. So, those who were implicitly relying on financial scholarships to fund some or whole of their expenses might become more anxious but the

good news is that it will only help you being more aggressive in pursuing scholarships.

- **Career prospects in USA became more lucrative** – Right now you are thinking about how much you will have to spend but the good news is that once you start earning (and that begins right when you secure scholarships and start earning stipend), the value of that will be so much more as well in India. So, one should look at the positive side and use this forex volatility to her benefit.

It might be a good time to get formal advice from your CA and Investment Advisor to help you plan your foreign expenses. Particularly, talk to them about the following:

- **Let loans help you** – For those students who are all planning to leave for abroad soon, it might be better to use loans to augment your finances. However, do not take out too much extra loans right now and wait for the rupee to stabilize before borrowing more money later on.

- **Be investment savvy and protect yourself against fluctuations** – Now, if you are a little money savvy, you can make intelligent investments that can protect you against further volatility in Rupee and Dollar.

As mentioned before, if you have planned properly and MS fits in with your personal goals, these economic factors might be a temporary roadblock and will not matter in the long run. So, it is important to be focused on your goals and work sincerely towards your ambitions. Once you graduate and prepare well, a bright career automatically lines up. On the other hand, pursuing any line without due diligence and introspection will only lead to confusion and frustration. This is further discussed in Chapter 2 and 3.

How to use this book?

If you are exploring options and haven't decided whether to pursue MS or not, Chapters 1-4, 11 and 14 will give you a good background to make an informed decision. Once you have decided upon MS, look into the Chapters 5-12 for understanding the application process and successfully applying to the top ranked programs. Ideally, you want to read this book in the second or third year of your engineering so that you have enough time to plan your applications. Chapter 13-14 will tell you what to expect once you are admitted and how to make the best out of your graduate school experience.

1 How Many Engineers are Required to Change a Light Bulb?, by Akhilesh Tilotia and Kawaljeet Saluja of Kotak Institutional Equities, April 2013

2 http://www.livemint.com/Industry/HCWB4sLvFBxfIFyNBYtqOP/Degree-in-hand-a-generation-of-engineers-looks-for-alternat.html

3 source: USNews

4 https://www.asme.org/career-education/articles/early-career-engineers/engineering-salaries-on-the-rise

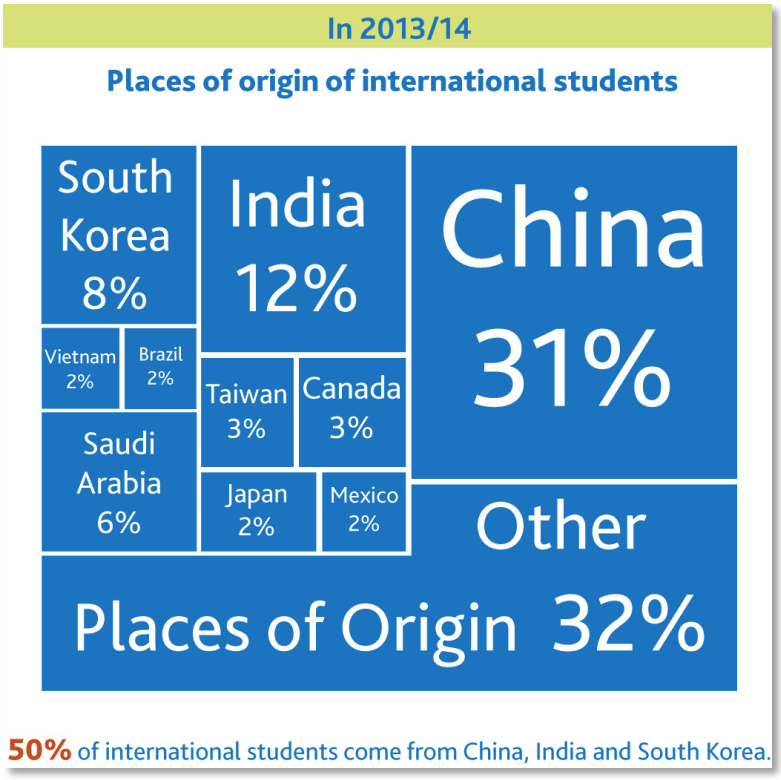
5 http://naceweb.org/s09182013/top-paid-majors-salary-survey.aspx?land-salres-lp-2-spot-slsrv-11222013

Chapter 3

Why Should You Go for MS?

Why should you go for MS?

Going abroad and leaving behind your family and dear ones is not an easy choice. One should take such a step only after careful deliberation. There are many reasons that make going abroad for MS an attractive choice. In Aug 2009, 32,000 Indian students went to USA for pursuing MS/PhD programs and they accounted for 25% of total science and engineering students enrolled in graduate programs in US universities.[1] According to Institute of International Education[2] (IIE), 42% of the 886,000 international students at U.S. universities in 2013 to 2014 hailed from China and India with 221,000 being Indians. In another report by Council of Graduate Schools[3] (CGS), first-time enrollment of graduate students from India increased 27% in 2014, following a 40% increase in first-time enrollment in 2013. In the international graduate enrollment at USA, the only country that surpasses India is China as shown in the image here.



Why do Indians continue to go in large numbers to USA to pursue their higher education and dreams?

As per Peggy Blumenthal[4], senior counselor at IIE, a recent strengthening of the rupee against the U.S. dollar has made U.S. graduate education more affordable for

the middle class and sluggish economic growth in India has meant fewer jobs for recent college graduates. Let's look at some of the biggest reasons.

Financial advantages

The number of Indian students going abroad for better opportunities have risen 256% in the last decade.[5] The topmost reason for such a brain drain is that pursuing a MS is the perfect way to enter the American job market that offers attractive employment scenario - better quality work and higher compensation packages.

Let's talk money first. In simple terms, the salary one can expect by working in USA is much higher than in India. This is a consequence of higher value of Dollar as well as the higher value of labor in USA. Plus, to your benefit, engineering job opportunities are on the rise these days. It remains one area that has bounced back strongly after the recession of 2008.

Good students from well-reputed graduate programs can expect a starting annual salary of $75,000 with highest offers crossing six figures mark. As per this table compiled by Michigan Tech College of Engineering based on the data from United States Department of Labor Report of Oct 2013, the starting salaries are stupendous[6] for someone who has lived in India.

Industry	Median Salary	Top 10% Salary
Biomedical Engineering	$81,540	$126,990
Civil and Environmental Engineering	$77,560	$119,320
Chemical Engineering	$90,300	$146,650
Electrical and Computer Engineering	$84,540	$128,610
Geological and Mining Engineering and Sciences	$82,870	$129,700
Materials Science and Engineering	$83,120	$126,800
Mechanical Engineering	$78,160	$119,480

Table 1: 2014 Engineering Salary Statistics

Addressing the claim that foreign education is unaffordable in the first place, one can argue that the return on its investment is much higher and it's easier to end up with higher savings in 5-7 years after graduating from a good university. With the higher starting salaries, one can quickly repay the student loans. Plus, in most cases, scholarships are available for engineering graduate studies which means that you can start earning right from the beginning (and of course no loans to repay). This is further discussed in Chapter 11.

Improved career prospects

USA was called the land of opportunity because it offered a quality of life that a foreign immigrant could not easily get in her homeland. To what extent is that still true is an open question but there still are factors that attract Indians to live and work in America. It is believed that if you are talented, you will be recognized and valued for it in America. Come to think of it, how many times have you felt frustration over not getting something done in India because you did not know the right connections or did not play nice with the authorities? An intellectual middle class youth finds her flummoxed when she doesn't get the deserved promotion or right opportunities where she can prove herself and rise to success.

One of the topmost things people love about America is the quality of work. This is evident in engineering space as well. While India is hailed as the front-runner in IT, the IT jobs that are outsourced to India are no match to the work that is retained in the United States and Europe. Core development and designing is still preferred to be done in-house by the American companies and only the low quality maintenance work is outsourced to India. This is why although every major company has an office in India, these are usually the back offices where little real development happens.

An American graduate degree also opens your door to some elite jobs that are not available otherwise. Usually MS grads are hired at Associate levels with much higher starting salaries than what they will earn back in India. Many companies run Associate programs that are only open to graduates of select schools. Thus, the career growth one can expect by working in USA or Europe is better than what is typically offered in India.

Another factor is the working culture. Without generalizing too much, a lot of Indian work places can suffer from lack of time management, favoritism, promoting seniority over talent and some such policies that lead to employee dissatisfaction.

This is also reflected in the higher attrition rates in Indian workplaces. It is common to work 10 hours daily in India and to some extent, it is expected by the Indian bosses but in USA, people give equal priority to personal time and do not expect the employees to spend more time at the offices than necessary. This is only one example but it reflects on the fundamental difference in the professional expectations. Consequently, Indians are much happier working with their American teams than Indian counterparts.

Indian education not delivering

As per this study by Vivek Wadhwa (image on the left),[7] executive in residence at Duke University's engineering school, India has an oversupply of all engineers, while an undersupply of globally competitive engineers. He claims that even the graduates from IIT and topmost institutes are no better than average American graduates from his own university, Duke. And as you move down the ladder from these top establishments, education quality declines steeply. A 2005 McKinsey Global Institute study had declared that only 25% percent of Indian engineering grads were qualified to work in multinational companies as opposed to 81 percent for US grads.

One might think that the competitive nature of Indian education also translates into higher quality education. But it simply doesn't!

The problem stems from the fact that education scenario in India is getting more and more messy and confusing - something like spaghetti. With ever growing population, India has failed to scale its infrastructure and resources. Although colleges are sprouting like mushrooms, the quality of education and faculty has vanished fast and only a handful institutes offer a worthwhile education and deliver a promising future for their students. When millions of candidates vie for a smattering of seats at IITs, IIMs, AIIMS and NITs, a large number are left to find other suitable options at other colleges. Sometimes, especially in case of medical students, many have to compromise on pursuing non-medical careers or pay a crore (yes, you read it correct) to get a donation seat at private medical colleges. The competition is no

less intense for commerce stream where majority of students try for CA or CS or getting into prestigious colleges like Shri Ram College of Commerce where cut-offs can be impossibly high. Most of the BCom, BBA students coming out of mediocre colleges struggle to land jobs and even when jobs are more readily available for engineering students, the calls mostly come for support, maintenance, call center positions and BPO operations. This builds a huge funnel of MBA aspirants that struggle to clear CAT entrance for IIMs. The competition is well reflected in the astounding acceptance rate where less than 0.5% of the candidates make it to the top MBA colleges.

This whole concept of entrance exam is blight in our academic field because it means that - one, a student may not even get to study what she wants to and two, a child's future is on the mercy of her performance in one exam. When the unsuccessful candidates choose to take a drop year to try their mettle next time, they are not only subjecting themselves to intense pressure of expectations but also risking one important year in prime of their lives. This is all the more fatal because they are not adding to their skills while preparing for a mere entrance exam, thus this year is really wasted if they do not crack the exam in the next attempt.

Other interesting fact to note is that despite the utter competition for IITs and IIMs, they stand nowhere in global rankings. So while Indian students go through cutthroat competition to get into IITs, the education they end up getting is not even among the top 100 institutes in the world.

The fact is that best universities in India cannot compete with Harvard, Stanford, Yale, Princeton, Oxford and Cambridge in terms of education quality. The faculty there includes Nobel Laureates and groundbreaking researchers. Since the faculty is so well qualified in these institutes, the foundation of the education received by the students is solid and resilient. As a result, the students always perform great whether the job market is strong or not. In contrast, the superficial knowledge being disseminated at Indian colleges breaks apart at its first encounter with reality in the corporate world when many students fail to perform at required levels due to their weak concepts.

This explains to some extent why USA has produced so many original thinkers and houses most of the biggest brands and companies - Apple, Microsoft, Google, Yahoo to name a few in IT space. Many talented Indians when groomed in USA have done great themselves - Vinod Khosla, Satya Nadella, Fareed Zakaria and so on.

This begs the question - why not look into better options of studying abroad?

Better personal development

Last but not the least, studying abroad forces one to come out of her comfort zone and become competitive in today's world. Remember that globalization is happening at a fast pace and MNCs are looking for smart candidates who can deliver in global teams. An international education and work experience can put one at a huge advantage when it comes to job hunting or seeking promotions. The upbringing in India makes one extremely deferential and shy - something that hampers one's chances of becoming a good manager. Surviving on one's own in a foreign land will undoubtedly help develop the personality and confidence to become better leader and decision maker.

So, while studying abroad has its own great merits, combined with the fact that Indian education offerings are grossly under-delivering, *it makes sense to seriously consider the option of going abroad for MS for a better future*.

Why MIS?

Similar financial and academic reasons apply for students interested in pursuing MS in MIS as well. But, many students wonder whether they should go for normal Master's or a program like MIS.

As technology spreads to every tiny aspect of our lives, role of engineering management is becoming more relevant in every domain and industry. Be it pharmaceutical company or an agricultural one, everyone is dealing with engineering challenges at some level – chemical, mechanical, civil, hardware electronics engineering dealing with tangible products while software and computer engineering dealing with the abstract information.

Understandably, there has been a constant increase in the demand for managers who understand technology and engineering aspects alike which gave rise to programs such as MEM (MS in Engineering Management), MIS (Management Information Systems), MIM (MS in Information Management), MSIS (MS in Information Systems) and so forth. One theme that underlines all these programs is that they are core business programs with engineering electives. The focus is still on management courses such as statistics, analytics, supply chain etc. These programs open the door to employment opportunities in business analysis, consulting, product management and other roles at the intersection of engineering and management -

thus, offering a chance to shift the focus of an engineer's career from core domain related roles to analytical and managerial roles.

Some of these course names might be confusing, so let's take a look one by one-

MEM – Core management programs with courses in Marketing, Finance, Management, Operations, Modeling and available engineering electives (not just software but Industrial Engineering, Nanotechnology etc), these typically prepare candidates for consulting or business analysis in any engineering related work function. Duke's MEM program is leading in this category in which the incoming student profile is widely distributed among various engineering majors.

MIS – More like MEM for IT, it focuses on IT electives such as Data Mining, Artificial Intelligence, Networking etc. One might think of it as a less competitive version of MBA specializing in Information Systems (but then, less reputed than an MBA too). Expect roles such as system analysts, data analysts, systems engineer, database admin after graduating from this program.

MSIS, MIM – These are other variations of MEM and MIS programs. You will find some more such as MSTM, MSEM offered with various names in different schools. Before you decide which one to apply to, take a good look at the curriculum to ensure it suits your background and goals.

Here are some common questions that students have about these programs-

- Should I go for MIS only if my profile is not good enough for MS in Computer Science (and other branches respectively for MEM)?

This is a misconception that MIS stands second to core engineering MS programs. I have known students with excellent profiles and a shot at top MS in CS programs to opt for MIS because of their career goals. It is important to understand the difference in career paths that stem from MS CS vs MIS. You should see which program aligns better with your career goals and not choose based upon its perceived reputation in your head.

- If I want to do MBA later on, then should I still go for MIS/MEM?

Many MIS/MEM programs are offered by business schools (and some by engineering schools). As a result, you might be taking some courses along with the

MBA students. I recommend doing MBA much later in career for either switching your career stream or to get a jump in career ladder within your industry. Doing a MIS/MEM (granted that it fits in with your aspirations now) will not rule out an option for MBA later on. You might be studying some of the courses again but you can still do it if you feel the need to do so.

- Are the job prospects after MIS/MEM worse that MS or MBA?

Please understand that all these are different programs and hence comparing them is not fair. MS and MBA have been there for a long time and have established reputation whereas MIS/MEM programs are comparatively newer and still building their base. And this is the reason that they are growing steadily in demand as well. Wouldn't you have rather done MBA when fewer people were doing it and there was a higher demand rather than when the market is saturated and practically everyone has an MBA? Top MIS/MEM programs such as Duke, CMU, Stanford etc. are highly competitive and graduating from them is highly rewarding in terms of career opportunities. So, I feel that if you graduate from a good MIS/MEM program, you will not be compromising on any job prospects compared to other fields. Currently, there is an employment boom for engineers (especially CS related), which may change later on. Therefore, job prospects after these programs depends on the industry demands and not the reputation of these programs alone. As is true for MS or MBA, doing MIS/MEM from higher ranked schools should open lucrative opportunities for anyone.

- How can I make my MIS/MEM application stronger?

Following things can help especially for MIS/MEM:

  - Having at least a year of full-time work experience. This is because management programs benefit from exposure to industry and students can better contribute to the classes if they have worked previously. Also, they are able to better understand some concepts that are applicable in real world jobs.

  - Get at least one LOR from the Industry. This can come from your Manager if you are employed or a project guide if you are an engineering student and did some industry project/internship.

- So, should I apply for MIS or not?

If you want to get into IT consulting, Analytics, Project Management, Product Management etc. kind of careers, then and ONLY then you should opt for MIS and NOT because it is less competitive or easier entry for US.

Caveats

Despite the overwhelming plusses of pursuing MS and career opportunities in USA, one must also be aware that it is a foreign land and you will miss things about your home. Also, doing MS for wrong reasons might lead to nowhere, adding to your frustration. If you haven't thought about the eventual careers to which your graduate degree could lead, then you might be setting yourself up for failure. It can be a big mistake to join a graduate school because you can't find a job or don't know what else to do. Understand that MS can take up to two years of your life and a PhD could run more than five years long - you should have a good reason to spend these years back at school instead of working. For its financial repercussions, check out the break-even analysis in Chapter 11.

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[1] as per NSF report 2009 - http://www.nsf.gov/statistics/infbrief/nsf10324/nsf10324.pdf

[2] http://www.iie.org/en/Research-and-Publications/Open-Doors/Data/International-Students

[3] http://cgsnet.org/first-time-enrollment-international-graduate-students-continues-rise

[4] http://news.sciencemag.org/education/2014/11/data-check-why-do-chinese-and-indian-students-come-u-s-universities

[5] http://www.theage.com.au/comment/brain-drain-a-headache-for-india-and-china-20131023-2w1kg.html

[6] http://www.mtu.edu/engineering/outreach/welcome/salary/

[7] http://spectrum.ieee.org/at-work/tech-careers/outsourcings-education-gap

SUCCESS STORIES

Interviews of Successful Professionals

Road Beyond MS

Advice from Successful Graduates and Professionals

Mobility Engineer at Motorola

MANISH MAHESHWARI

UIUC - MS Mechanical Engineering '06

Manish graduated with MS in Mechanical Engineering from University of Illinois at Urbana Champaign in Dec 2006 and joined Motorola Mobility in Jan 2007. He is currently working as a Senior Staff Mechanical Engineer at Motorola Mobility. In fast changing and evolving cell phone industry, the mechanical designs need to be developed, analyzed and tested quickly and efficiently. He uses analytical and numerical methods, commonly known as finite element analysis to analyze mechanical designs of cell phone; identify and mitigate any structural issues found in the design to increase reliability. In parallel he also develops new materials, sensors and components for future technology.

His passion for his work is evident in the way he talks about it enthusiastically.

So, when he was asked if he thinks graduate school is responsible for where he is now, he responds without any hesitation - "Definitely, yes."

Would you advise current students to pursue MS?

I wish life decisions were as simple as black or white. I can give my insight and let the readers decide. If you are looking for depth of knowledge in any field, MS and PhD will help you. Graduate study at any good university will provide you sufficient knowledge to work with most companies in that domain around the globe. On the downside, you are more focused on a particular subject that means you have almost decided that your career can materialize in that field only as far as job is concerned unless you have the guts to take the risk to come out and start something of your own.

I think it's a good idea to explore the world and get broader perspective of life in general. What could be a better way of doing it other than studying abroad? As students, we still have less responsibilities, so we are more open to delving into and absorbing what the world has to offer. However, living away from family could be challenging. Will you miss out several festivals and weddings of your cousins? Most likely yes. Is that worth the comfort and money you will be getting for yourself and your family?

Visa situation is always challenging when finding jobs abroad and it can get worse - be open to move around a little even after your graduation. Your degree and knowledge will definitely help you find an opportunity that is best fit for you in some part of the world.

My family takes pride in what I have achieved and have been very supportive for all these years. I have been able to provide significant monetary help to several of my extended family in need and that means a lot more to many of them. I have made a decision to visit India once every year and fortunately I have been able to do that so far. Lately even my parents and in-laws have been visiting us every year since last several years now so I do not miss out a lot about family time. As far as living standard, comfort, respect and life satisfaction are concerned, I and my family are extremely satisfied with where we are now.

My wife Rashmi Maheshwari also did her MS in Computer Science from Illinois Institute of Technology, Chicago after marriage. I am very proud of her to make that decision and graduating with 4.0 GPA. Currently she is working as a Senior Software Engineer at Enova Financial and has a very successful career.

Manish is a believer and got reminiscent when asked about his background before joining the graduate school in USA.

I graduated from Indian Institute of Technology Kanpur with Bachelor's of Technology in Mechanical Engineering. After graduation, I joined Tata Motors and worked there as a Mechanical Engineer for one year. I was a small town kid from middle class family with limited insight to the outside world until high

school. IIT Kanpur and United States brought huge change to my life but both of them provided me a platform to grow as a person. One thing that helped me all along is having an optimistic mindset. Some of the friends told me that I take world on its face value and that may be harmful but so far world has not been very cruel to me - touchwood!

What may not be very evident from his success story is that he never intended to go for further studies when he finished his BTech at IIT. Manish was all set to start working and accepted offer from Tata Motors where during his first year itself, he got opportunities to work in several domains in Automobile Industry including quality, operations and design. With his experience, he found himself best suited for design and development.

Before Tata Motors, I never considered about pursuing MS and that too from USA was never into my mind. My academic knowledge was enough for routine work in company but after a year, I felt I would like to work on more challenging and front-end design work. At that point I felt that depth of core engineering knowledge with higher education would help me reach there. After consulting with my manager in Tata Motors, professors from IITK and some seniors, I decided to apply for MS in the United States. The two fields of my interest were Robotics or Numerical methods in Structural Mechanics. I did apply to universities that focused on those fields and I received offers to accept either of the fields. After consulting with some professors from IITK and MS advisor in UIUC, I decided on Structural Mechanics as it seemed a better fit if I want to pursue job immediately after my MS.

What would be your advice to someone who is on the fence about whether to apply or not?

MS or PhD in Engineering will narrow your career to certain fields. I have seen many people who study core engineering and end up contributing to their fields for most of their career after graduation. If this is something that excites you, then welcome aboard. Some people take higher studies just as stepping step to go around the world and explore one more domain while exploring new country

and new culture. If you are in no hurry to just decide your career but would like this to give you a better perspective of life, again welcome aboard. Just if you are curious, I fall in the first category and my wife falls in the second. However, I have seen some people using graduate school as an entrance to USA with the hope that they will eventually land some job with a contractor – even completely different from their field of study. If that is the case, I would suggest that you give it a second thought and figure out what you want to achieve in life. You may be able to find some jobs and make some money but will you be happy doing that? Ask that question to yourself and make an educated decision.

Do you think it is better to gather some work experience before joining MS?

If you don't have any previous internship experience, I would insist that you join MS after getting some work experience. It may not matter much from curriculum and academic perspective but you will be much better placed to find a job afterwards. My resume was very strong because I had already worked with an automobile company and I had experience of working with a startup while at IIT. Besides, it gives you a precious window to figure out whether you want to do MS in first place. If you don't enjoy the technical field in first job, you might want to try sales or marketing and for that MBA will be better option than MS.

What were your goals when you joined graduate school?

Study smart and get into the core engineering so that I could get to the depth of the subjects of my interest. I wanted to explore the western culture and foster self-confidence.

What did you do to ensure you are moving towards your goal?

One, I was always in touch with my previous professors and current MS advisor. I always believed in open communication with my advisor and had informed him that I wanted to go back to the Industry after completing my MS and he assigned me a project that was relevant and helped me in finding jobs and provided references.

Second, I focused on taking the courses that were relevant without thinking a lot about grades! Most courses were fun and a ton of help was available if needed. I used to register for 5 to 6 courses and attend their lecture for one week before finalizing my 2 to 3 courses for each semester. Teaching assistants (TAs) for courses were best source of getting quick advice whenever I was stuck in projects or assignments. Later my wife followed the same process and was able to find courses that she wanted to take and enjoyed throughout her study.

Then, I learned to find a balance between my work and life. I studied a lot more here but in contrast I played a lot more as well. I had a lot larger and meaningful social life along with my studies during college. Each semester I took one sports course like ice-skating, bowling etc.

Finally, I took full advantage of the placement services in university.

Did things work out as you had imagined?

They actually worked out better than my imagination. I came in without pre-approved funding but believed in myself that I will manage it with my hard work. I also came prepared with a mindset that if the MS and life is not something that I like or I can afford, then I will go back home. So it was calculated risk. However, I got my funding, I enjoyed both studies and life to a large extent.

What would you like to say about the curriculum? How did you choose the courses?

There was no set curriculum - I chose what I wanted to study. Most courses relevant to the thesis project but some other to bring diverse experience in latest technologies.

Can you share any tips on how to choose the courses?

First, I hope you are serious about your MS in the field you enroll, and then only following will apply. I have seen people enrolled for MS in Mechanical

Engineering and trying to find a consultant who can get them job in SAP. If you are serious and give your 100%, I have observed that each field has enough jobs and you get paid well and moreover have personal satisfaction in life… Back to tips:

1. Talk to your advisor - they have guided 100s of students before you and they can easily pave the way to success for you in your field of interest right in first meeting.

2. Choose a thesis option if possible - This is because thesis option gives you depth of knowledge about a particular subject that you are master of and most people will not be able to question that. At the same time it gives breadth of knowledge by interacting you associate with group of postgraduate students with your advisor - You learn a lot about their work by helping them or just by attending weekly status meetings. It also gave me an option to prospect PhD option for myself by reading hundreds of research papers and trying to find in-depth and novel solutions for technical problem in my thesis project. Subsequently I was clearly able to decide that industrial work is more fun and a better fit for me.

3. Signup for 2 or 3 extra courses and attend all classes for a week - Cannot emphasize enough on doing this - this is the best way to find good courses. Sometimes courses may be good but you may not like the instructor.

4. Finally register for required credits by the courses you like – generally, taking 3 graduate level courses is a lot of work. So don't try to take more than that.

5. Do not take more than 2 project based courses – make sure the third one is theory course. Project takes the most amount of time and many a time there are group projects which take even longer.

How important is an internship?

I did not get a chance for pursuing an internship during MS but if you can – you definitely should. I had internship experience from B.Tech and one year of job experience after B.Tech that compensated for not having internship here. I interviewed with 34 companies in last semester just because I had both internship and work experience.

Why didn't you do internship at UIUC?

I already had work experience from two companies that was sufficient to make decision between academia vs industrial work environment. Therefore I decided to use my summer to work on my thesis and graduate early. It allowed me to graduate with thesis in only 3 semesters, which is very uncommon at UIUC.

What was your internship experience?

During my B.Tech. I worked in an Advance Robotics Lab in Singapore affiliated with National University of Singapore. Work was fun but it was more fun to learn to eat chapatti with chopsticks. One of my recommendations also came from my internship advisor at Singapore.

Can you share any tips on landing right internships?

Seniors and career services play a big role in helping you find a good internship. Put up as much effort as you can - I have seen my company prefer to take interns and then give the good performing interns an offer for full time positions. You will be much more relaxed when you have an offer in hand and later you can use all your energy to find the better fit or negotiate salaries.

Any interesting details that you can share about your MS journey?

A wide grin features on his face when he talks about this.

Work hard and play when you are tired of working... I cannot forget those late night card games, clubbing, swimming, tennis and badminton on weekends. Ice-skating and skiing during winter time was unforgettable experience. Best part

was cooking and housekeeping when 3 guys were sharing a 3 bedroom house - making those charts to plan breakfast, lunch, dinner and cleaning routine and at month end trying to figure out the expenses and who owed what! It got easier as time passed as instead of chart the mutual understanding worked better - the time best spent and the best friends I made was during my MS journey.

What was it like to find a job?

Fun but stressful. I was lucky to have several interviews planned so I was hopeful to find a good job for myself. However visa situation is always a risk and I missed out several opportunities because of that. Even when I had few on-site interviews lined up I still kept applying for more until I had an offer letter in hand.

How much did career services help?

This is where career service helped me mostly:

1. Preparing for resume - I edited my resume multiple times with career advisors and got to a clear and concise resume that leaves impact on 1st glance.

2. Mock interviews helped me prepare for behavioral questions - mostly there is no right or wrong answer there but preparation helped me to be clear about my thoughts.

What can students do on their own to find the jobs? Any tips on how students can find the right job?

1. Actively participate in career services workshops and talk to them in advance - first and foremost, work on your resume with them and seek advice on past couple of years of placements in your field

2. Must attend career fair - dress appropriate and be confident. These sessions do not give you the job rather companies are there to sell themselves - My approach was to ask most of them that what can their

company offer me as fresh graduate. I wrote down notes and those helped me prepared my answers for interviews. Dropping resume with them does not help much in getting interviews instead always ask all the details about how to apply online.

3. Don't be afraid of talking to your advisors and professors - they are the best people to refer you to past students from their group. This is the most efficient way to find a good match and reference for most assured job offer.

4. I was not heavy in social networking - but I have seen many of my friend's getting good references through social networking from previous college or school.

5. Look for companies and labs in near-by cities online and check their career portal - most of the companies prefer to hire from local universities but do not have resources to visit all universities in area. Mostly the success ratio is 1 out of 10 companies to get response but do not hesitate to apply between 50 too 100 companies in area which may not visit your campus. I have guided few students from local universities in Chicago this way and they were able to get more than 10 calls like this.

Looking back, what can you do differently to get more from graduate school? What would you be more mindful about if you got the opportunity to do it all over again?

Perhaps not, I really enjoyed every aspect of my grad school experience and I am very proud of that.

As we wrap up, there is a growing popularity of programs like MIS and MEM these days. What are your thoughts on that? Do you recommend them?

I would highly recommend MIS, MEM. An MIS after 2-3 years of work-ex can make you super competitive for amazing job offers in IT or software fields.

Another concern that many people share is whether MS degrees hold the same value if they come back to India upon graduation. What are your thoughts on that?

MS is definitely very valuable back in India even if you have to go back immediately after school but it's preferable that you work in USA itself for a few years. My friend at Motorola recently was offered amazing offer from India and he is moving back. So, opportunities in India are sprouting up nicely.

Between MS with and without thesis, which one do you recommend?

I would strongly recommend MS with thesis because it lets you become a Master in your special topic. Also, it gives you a chance to hang out with super smart people in your research group and you can learn so much from them. This is what I truly enjoyed. Plus, if you are getting paid through assistantships, then why not?

Results 2015

Admission Results of Scholar Strategy Students for Fall 2015

- Sadavath S – MS in Business Analytics (325, 80%, 2 yrs work-ex) – **UT Austin**
- Akash S – MS in Mechanical (319, 9.55, 1 yr work-ex) – **UC San Diego, Columbia, CMU, USC**, U of Washington Seattle, ASU
- Mohnish P – MS in ECE/CyberSecurity (325, 8, 2 yrs work-ex) – NYU Poly, **CMU MS IT, John Hopkins, Columbia MS&E, Columbia MS in Computer Engg**
- Arushi A – MS in Data Science (320, 84%, Fresher) – **Columbia**
- Arushi A – MS in CS (320, 84%, Fresher) – **USC, UC Irvine**
- Hari P – MS in CS (314, 8.5, 2 yrs work-ex) – **SUNY Stonybrook, NCSU (MS CN)**, NYU Poly
- Karandeep – MS in Civil Engg (337, 8.7, 1 yr work-ex) – **UIUC**, U of Colorado Boulder, Colorado State Univ
- Navaneeth R – MS in ECE (307, 8.1, 1 yr work-ex) – **UMCP ENTS**, ASU, UIC
- Vipul M – MS in CS (315, 65%, 4 yrs work-ex) – **CMU** BIC, ASU, NEU MS in Information Assurance
- Vini G – MS in CS (321, 8.98, 3 yrs work-ex) – **Cornell MEng, USC (Data Science)**
- Vini G – MISM (321, 8.98, 3 yrs work-ex) – **CMU**
- Pragya T – MIS (650 GMAT, 68%, 3 yrs work-ex) – **CMU**, **TAMU**, U of **Cincinnati**, SUNY Buffalo, UIC
- Pratik C – MS in EE (Robotics/Embedded) – **CMU Robotics**, Tufts, KTH Sweden

- Anirudh S – MS in EE (324, 8.61, Fresher) – **Ohio State University, NCSU, Virginia Tech** non thesis, TU Delft
- Sushma G – MS in CS (318, 9.5, 1 yr work-ex) – **USC, Cornell MEng**
- Nishad S – MS in Embedded/EE (329, 7.98, 3 yrs work-ex) – UNCC, **NCSU**
- Vikas S – MS in Mechanical (315, 9.08, 1 yr work-ex) – **CMU, USC**, U of Washington Seattle, ASU
- Kevin G – MS in Mechanical (322, 9.1, Fresher) – U of Washington Seattle
- Kevin G – MEM (322, 9.1, Fresher) – **Cornell MEM**
- Indona V – MS in CS (325, 82%, 4 yrs work-ex) – **NCSU, TAMU, UC Irvine**
- Anas S – MS in CS (324, 8.0, Fresher) – **NCSU**
- Hardik J – MS in Mechanical (313, 68%, 5 yrs work-ex) – **TAMU**, U of Washington Seattle, UNCC
- Shantanu K – MIS (317, 65%, 2 yrs work-ex) – U of **Cincinnati**, UMCP MIM, UIC, USF, UTD (50% tuition waiver)
- Sahil N – MIS (312, 9.0, 2 yrs work-ex) – **CMU, UMCP**, NEU, USF, UTD, UIC
- Pranjal S – MS in CS (303, 71%, Fresher) – RIT, U of Delaware
- Ankita D – MIS (300, 8.92, 2 yrs work-ex) – Syracuse, NEU, IIT Chicago, NYU Poly, Stevens
- Srishti S – MS in EE/CE (Robotics) (321, 66%, Fresher) – WPI, UNCC, Colorado State, NYU Poly
- Yash G – MIS (321, 7.37, 2 yrs work-ex) – **U of Arizona Eller**, UIC
- Vikrant M – MS in EE () – NYU Poly, **U of California SantaCruz**, Vanderbilt, SDSU, Utah State University
- Vivek J – MS in Business Analytics (322, 7.24, 2 yrs work-ex) – Drexel with 12K scholarship, Louisiana State U, Waitlisted at University of San Francisco, University of Virginia

- Deepthi V – MIS (314, 8.5, 2 yrs work-ex) – **UMCP**, Georgia State University
- Alok S – MIS (322, 8, 3 yes work-ex) – **TAMU**, SUNY Buffalo
- Saumya G – MS Chemical Engineering (314, 75%, Fresher) – ASU
- Vinayak R – MIS (319, 72%, 2 yrs work-ex) – UIC, Syracuse, **UMCP, U of Cincinnati**
- Jaskaran K – MEM (320, 8.36, 2 yrs work-ex in Mechanical) – Case Western Reserve University with 40% scholarship, **UIUC** MSTM, **Duke**
- Srishty P – MIS (316, 78%, 2 yrs work-ex) – UT Dallas
- Mohnish P – MIS (325, 8, 2 yrs work-ex) - **CMU**
- Samiksha R – MIS (294, 58.8%, 1 yr work-ex) – RIT
- Lokesh A – MS in CS (314, 60%, 2 yrs work-ex) – RIT
- Ramya – MS in EE (304, 7.36, 1 yr work-ex) – NYU Poly
- Sanket K – MIS (304, 63%, 2 yrs work-ex) – Stevens, WPI, USF, U of Florida, NYU MoT
- Prakhar M – MS in Construction Mgmt/Environmental Engg (296, Fresher) – Steven, Bradley, IIT Chicago
- Rohit A – MIS (299, 73%, 3 yrs work-ex) – NJIT, NEU, UNCC